

IN THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 7. This sheet, which includes Fig. 7, replaces the original sheet including Fig. 7.

Attachment: Replacement Sheet

BASIS FOR THE AMENDMENT

Claims 13-23 are active in the present application. Claim 13 has been amended for matters of form not affecting the scope of original Claim 13. Claims 21-23 are new claims. Support for the new claims is found in Example 1 and in original Claim 14.

No new matter is added.

REMARKS

The Office rejected original Claim 13 in view of a combination Fujimatsu (U.S. 4,205,037) and Sato (U.S. 3,885,013). The Office states that Fujimatsu teaches “a process of making an acrylic fiber as claimed, except that Fujimatsu does not explicitly teach two coagulation baths.” Applicants traverse the Office’s characterization of Fujimatsu with respect to the originally claimed invention (i.e., Claim 13).

Fujimatsu describes mixtures of a polymer and an organic or inorganic solvent (i.e., a spinning solution) wherein the concentration of the polymer is from 7 to 15% by weight (see column 4, lines 3-12 of Fujimatsu). In the case of concentrated aqueous sodium thiocyanate solutions, Fujimatsu discloses that the polymer solution may have a concentration of from 8 to 18 % by weight and the temperature of the coagulating bath should be from -5 to 20C (see Figure 1 of Fujimatsu). However, such conditions are only described for inorganic solutions, not for organic solutions. Thus, Fujimatsu does not disclose a spinning solution using an organic solvent as the solvent.

Likewise, Sato only describes the use of rhodanides as the solvent for preparing the spinning solution. Thus, Sato also does not disclose a spinning process that uses an organic solvent.

In contrast, the present claims require the inclusion of an organic solvent (see present Claim 13). Applicants submit that the conditions for spinning an organic solvent-containing spinning solution are substantially different from the conditions of spinning an inorganic polymer solution. Applicants thus submit that the presently claimed invention is not obvious in view of the prior art relied upon by the Office.

Applicants further note that the prior art invention provides a fiber having an anti-pilling effect (e.g., an anti-fibrillation effect – see Fujimatsu column 2, lines 62-65 and Sato column 2, lines 1-4). Such fibers are generally inflexible and thus may have a tendency to

crack (see for example present Figure 3). The fibers produced by the process of the claimed invention have improved strength and elongation properties (see for example present Figure 2) and thus do not need to have an excellent anti-pilling property.

Moreover, present original independent Claim 13 is drawn to a process that includes drawing a filament from a first coagulation bath at a rate of 0.3 to 2.0 times the discharge of the linear velocity of the spinning feed solution. In contrast, Fujimatsu discloses a process wherein wet-spinning of a polymer solution is carried out at a stretching ratio of 4 to 9 times (see column 2, lines 43-61; column 3, lines 17-20; column 4, lines 21-25; and column 8, lines 22-48). In fact, Fujimatsu emphasizes the necessity of carrying out the prior art process at a high stretching ratio:

It is necessary to set the primary stretching ratio at 4-9 times. **In case the primary stretching ratio is less than 4 times, troubles relating operation are liable to occur**, for example filaments tend to wind around spinning rollers. (Bold added; see column 4, lines 21-25).

Thus, Fujimatsu clearly discloses that a primary stretching ratio of a wet-spinning of a spinning solution of an acrylic polymer should not be carried out at a stretching ratio of less than 4 times. The presently claimed invention requires drawing carried out in a coagulation bath at 0.3 to 2.0 times the discharge of the linear velocity of the spinning feed solution. Applicants submit that the drawing rate recited in the present claims (i.e., 0.3 to 2.0 times the discharge of linear velocity of spinning feed solution rate) is not encompassed by the 4-9 times stretching ratio of Fujimatsu.

Thus, Applicants submit that the presently claimed invention is not obvious in view of Fujimatsu because the cited prior art does not disclose the drawing of the present claims.

Applicants draw the Office's attention to original Claim 14 and new dependent Claims 21 and 23 wherein the drawing of the filament is from 0.3 to 0.6 times. The stretching of the filament from the second bath is 1.1. to 1.5 times in new Claims 22 and 23.

Further to the discussion above Applicant submit that because Fujimatsu states that a stretching ratio in the region of stretching ratios of the drawing step of the present claims is unfavorable, the presently claimed invention is further patentable over Fujimatsu on the grounds that Fujimatsu teaches away from the presently claimed invention. See MPEP §2144.05 which states:

A prima facie case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997).

Applicants submit that Fujimatsu's disclosure that a stretching less than 4 causes troubles is a clear teaching away from the presently claimed invention and therefore the claimed invention is patentable over the cited prior art.

Even if Fujimatsu disclosed all of the features of the presently claimed invention, which is not the case, the combination of Fujimatsu with Sato would not render the presently claimed invention obvious. For example, present independent Claim 13 requires drawing a filament through a first and second coagulation bath. The Office asserts that Sato discloses such an embodiment and cites to column 5, lines 30-45 of Sato as support. This disclosure of Sato is reproduced below for convenience:

As another embodiment of the present invention, the following two-stage coagulation process can be carried out without departing from the invention **so far as the first bath can satisfy the foregoing preferred range of the linear velocity ratio of free-extrusion and jet-stretch ratio.**

Therefore, the following multistage coagulation process to form filaments, for example, may be of course used as an embodiment of the present invention. Namely, **after the first-stage coagulation step satisfying the above mentioned linear velocity ratio of the free-extrusion and jet-stretch ratio, the coagulated filaments are further introduced into a second-stage coagulation bath having a solvent concentration of 20 to 30 percent based on the concentration of the inorganic solvent used for the preparation of the spinning solution. (Bold added).**

As is evident from the two paragraphs reproduced above from Sato, the second-stage coagulation of Sato is not one that is carried out with any particular drawing or stretching. In fact, Sato explicitly states that the free-extrusion and jet-stretch ratio is satisfied in the first stage coagulation process. Sato therefore discloses a two-stage coagulation process wherein the second stage coagulation is carried out with a certain solution but otherwise does not disclose that the second stage coagulation is carried out at any particular stretching (e.g., drawing) ratio. Thus, even if Fujimatsu disclosed all of the claim limitations except a two-stage coagulation process, the combination of Sato with Fujimatsu could not render the presently claimed invention obvious because Sato does not disclose a second-stage coagulation that includes the drawing and/or stretching of the second coagulation bath in present Claim 13.

Although Sato discloses secondary stretching (see column 6, lines 32-35 and column 6, lines 60-63), each of Sato's secondary stretchings are carried out under dry heat conditions. This is different from the drawing or stretching in the second coagulation bath of present Claim 13 which is carried out in an aqueous organic solvent solution (e.g., carried out wet).

Applicants further submit that even if Sato discloses a process having two coagulation baths, it would not be obvious to combine Sato and Fujimatsu because any disclosure of Sato with regard to a process having a stretching ratio less than 4 would teach away from the combination of references. In this regard Applicants draw the Office's attention to MPEP and MPEP §2145(X)(D)(2) which states:

**References Cannot Be Combined Where Reference Teaches
Away from Their Combination**

It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).

Applicants submit that the presently claimed invention is not obvious in view of the cited prior art for the reasons discussed above, including: (i) Fujimatsu's teaching away from the presently claimed invention (e.g., Fujimatsu's disclosure that stretching in a coagulation bath at less than four times causes troubles), (ii) Fujimatsu's silence with respect to carrying out coagulation and drawing (e.g., stretching) at the 0.3 to 2.0 ratio of the present claims, and (iii) Sato's silence with respect to stretching and drawing carried out in a second coagulation step.

The Office further rejected the present claims under obviousness-type double patenting in view of Claim 17 of a patent to Ikeda (U.S. 6,503,624). Claim 17 of Ikeda recites, as the first step:

extruding a spinning solution which is a solution of an organic solvent comprising an acrylonitrile-based polymer containing at least 95 wt % of the acrylonitrile unit into a first coagulation bath . . .

In contrast, the first step recited in present Claim 13 states:

discharging a spinning feed solution comprising an acrylonitrile polymer comprising 80 wt % or more and less than 95 wt % of acrylonitrile unit in an organic solvent . . .

The subject matter of present Claim 13 and Claim 17 of Ikeda are exclusive of one another because Ikeda requires that the acrylonitrile-based polymer contain at least 95 wt % of acrylonitrile unit whereas the presently claimed invention limits the acrylonitrile polymer to comprising 80 wt % or more and less than 95 wt % of the acrylonitrile unit.

Applicants submit that because the present independent Claim 13 and Claim 17 of Ikeda are mutually exclusive, no obviousness-type double patenting arises.

The Office further rejected the present claims under obviousness-type double patenting in view of a patent to Kasabo (U.S. 6,641,915). As was discussed above for the obviousness-type double patenting rejection in view of Ikeda, Applicants submit the Office's

rejection of the present claims under obviousness-type double patenting in view of Kasabo is likewise defective. Kasabo includes claims wherein the acrylonitrile polymer has 95 wt % or more of an acrylonitrile unit. In contrast, the presently claimed invention (i.e., Claim 13) recites an acrylonitrile polymer comprising 80 wt % or more and less than 95 wt % of acrylonitrile units.

Applicants submit that because the polymer recited in the present claims and the polymer recited in the claims of Kasabo are mutually exclusive, there can be no overlap of the claimed subject matter and thus the obviousness-type double patenting rejection should be withdrawn.

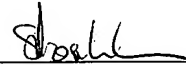
Applicants note that page 1 of the Office Action of May 10, 2006 includes an objection to the specification (see paragraph no. 9). However, the Office Action did not describe any objection to the specification. Applicants assume that this objection is only a typographical error and no correction to the specification is necessary.

Figure 7 is amended herein in order to identify Figure 7 as prior art.

For the reasons discussed above, Applicants submit that the rejection under 35 U.S.C. § 103(a) and the rejections under the judicially created doctrine of obviousness-type double patenting are not supportable and should be withdrawn. Applicants submit that all now-pending claims are in condition for allowance and respectfully request their passage to issuance.

Respectfully submitted,

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